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where the rainfall exceeds 70 inches, and there are twelve in which the rainfall exceeds 50 inches.

In the regions occupied by the red fir only three stations out of seventy are reported as having a rainfall less than 30 inches. This appears to indicate that the lower limit of the red fir is at or about 30 inches of rainfall. There is apparently no upper limit, the fir being found abundantly in regions where the rainfall exceeds 100 inches annually.

The redwood strip on the California coast includes but one station having a rainfall less than 30 inches, which appears to indicate that the isohyetal line of 30 inches is the lower limit of this species.

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## DRAINAGE MODIFICATIONS IN THE SOUTHEASTERN APPALACHIANS.

The following is an abstract of a paper by Prof. Douglas Wilson Johnson of the Massachusetts Institute of Technology which has just received one of the Walker prizes of the Boston Society of Natural History :

From time to time mention has been made of a capture of the former headwater portion of the Chattahoochee River, by the upper portion of the Savannah River, at the border between western South Carolina and northeastern Georgia. In the summer of 1905 the speaker spent several weeks in a study of the region in question. The results of this study appear to justify the following conclusions:

(1) The upper portion of the present Savannah River formerly flowed southwest through the Chattahoochee River into the Gulf of Mexico, but was diverted to the Atlantic drainage by a process of stream capture.

(2) The capture furnishes an example of what may properly be termed "remote capture," having occurred so long ago that much of the direct evidence has been obliterated.

(3) The capture resulted from the advantage enjoyed by the Atlantic drainage over the Gulf drainage, owing to the shorter course to the sea which streams of the former system traversed.

(4) Both the Tallulah and Chattooga Rivers (now tributary to the Savannah) occupy to-day the same general courses which they occupied before the capture, the combined waters of both streams having been diverted at the same time by a single instance of capture, which took place a short distance below their point of junction.

(5) The falls of the Tallulah River, while initially due to the capture by a stream at a much lower level, exist to-day, not because of the recency of the capture, but because of the presence of a hard rock barrier crossed by the Tallulah River, but not yet worn down by it.

(6) The similar falls which must have existed on the Chattooga and larger tributaries have been obliterated by those streams, not because they were captured first, but because the great lapse of time since the capture was ample for them more nearly to grade their courses in the less resistant rock over which they run.

The evidence upon which these conclusions are based consists, in part, of the entrenchment of the Tugaloo, Tallulah, and Chattooga Rivers, the higher and more open valleys of the tributaries to the Chattahoochee, the hanging valleys bordering the three first-named streams and their larger tributaries, the difference in hardness of rocks in the Tallulah gorge as compared with the other valleys, and the presence of old river gravels across the divide between the Savannah and Chattahoochee systems at this point.

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## GEOGRAPHICAL RECORD.

### AFRICA.

MAJOR POWELL COTTON'S EXPEDITION.—Reuter's Agency received news (May 25) from Major Powell Cotton's Expedition, which left England eighteen months ago on a journey from the Nile to the Zambezi. At the end of March the explorer and his wife were at Makala, Congo Free State, in the heart of the Ituri rubber district and one of the chief haunts of the okapi, where the expedition proposed to remain for a month or so in a final endeavour to secure specimens. The progress of the expedition has created much interest among the pygmy and other forest tribes, Mrs. Powell Cotton being the first European woman to penetrate the Ituri basin, and the camp has been thronged daily with natives curious to see the "white woman with the long hair." The explorers were in good health and were receiving every assistance from the authorities.

ASCENTS IN THE RUWENZORI RANGE.—The BULLETIN reported in the June number (p. 368) that three gentlemen had reached one of the peaks of the range. Information has since come almost simultaneously to London that the Duke of the Abruzzi has begun his ascent, and also that in April last Messrs. R. B. Woosnam, D. Carruthers, and A. F. R. Wollaston, three members of the zoological expedition sent to Africa under the auspices of the Natural History Museum, South Kensington, made two ascents in the Ruwenzori Range. On April 1, according to *Nature* (No. 1910, p. 132), they ascended Duwoni, the peak rising to the northeast of the Mubuku Glacier. This peak has two tops of apparently equal altitude; the southern top, which was reached, was found to be 15,893